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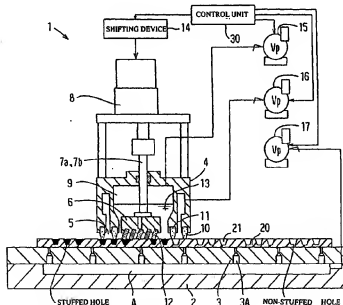
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(54) **Fluid material filling apparatus and related filling method**

(57) A vacuum pump 16 depressurizes a scavenging chamber 5 to discharge the air or gas residing in a via hole 21. Then, a paste chamber 9 provided adjacent to the scavenging chamber 5 moves on the scavenged via hole 21. A squeezing unit 6 provided in the paste

chamber 9 pushes a conductive paste 13 into the via hole 21. Keeping the inside space of the via hole 21 in a depressurized condition is effective to let the conductive paste 13 enter deeply into the via hole 21. The inside space of the via hole 21 is entirely filled with the conductive paste 13.

FIG. 1





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EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (INCL.7)
X	FR 2 803 227 A (NOVATEC SA SOC) 6 July 2001 (2001-07-06) * abstract; figures 1-6 * * page 2, line 1 - line 20 * * page 4, line 13 - line 24 * * page 5, line 7 - line 10 * * page 6, line 1 - line 10 *	1,3,4,8, 9,12-15, 20,21	H05K3/40
Y	----- PATENT ABSTRACTS OF JAPAN vol. 018, no. 611 (M-1708), 21 November 1994 (1994-11-21) - & JP 06 234204 A (MATSUSHITA ELECTRIC IND CO LTD), 23 August 1994 (1994-08-23) * abstract * * figures 2,3 *	2,16	
Y	----- PATENT ABSTRACTS OF JAPAN vol. 1996, no. 08, 30 August 1996 (1996-08-30) & JP 08 108519 A (SONY CORP), 30 April 1996 (1996-04-30) * abstract *	2,16	
A	----- PATENT ABSTRACTS OF JAPAN vol. 1996, no. 08, 30 August 1996 (1996-08-30) & JP 08 108519 A (SONY CORP), 30 April 1996 (1996-04-30) * abstract *	3,4	TECHNICAL FIELDS SEARCHED (incl. C.7) H05K
A	----- US 6 231 333 B1 (FERENCE THOMAS GEORGE ET AL) 15 May 2001 (2001-05-15) * abstract; figures 1,2,5 * * column 1, line 47 - line 49 * * column 2, line 56 - line 61 * * column 2, line 65 - column 3, line 1 * * column 3, line 12 - line 33 * * column 7, line 51 - line 63 *	1,3,4, 12,15,24	
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		18 February 2004	Deconinck, E
CATEGORY OF CITED DOCUMENTS			
X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background P: non-written disclosures I: intermediate document T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons &: member of the same patent family corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 02 1126

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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18-02-2004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2803227	A	06-07-2001	FR 2803227 A1	06-07-2001
			AT 242062 T	15-06-2003
			AU 2855701 A	16-07-2001
			DE 60003232 D1	10-07-2003
			EP 1244523 A1	02-10-2002
			WO 0149422 A1	12-07-2001
			FR 2803228 A1	06-07-2001
			US 2003000084 A1	02-01-2003
JP 06234204	A	23-08-1994	JP 3314434 B2	12-08-2002
JP 08108519	A	30-04-1996	NONE	
US 6231333	B1	15-05-2001	NONE	

EP 02 02 1126

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82